#10

ATTORNEY DOCKET NO.: QUEST1100
Application No.: 09/713,415

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of:	)	
	)	
Phillip D. Bondurant et al	)	
	)	
Application No.: 09/713,415	)	**Group Art Unit: 2877**
	)	
Filed: 11/15/2000	)	**Examiner: PHAM, HOA Q.**
	)	
For: Method and Apparatus for In Situ Inspection of Reformer Tube	)	

Hon. Commissioner for Patents
Alexandria, VA. 22313

Sir:

PRELIMINARY AMENDMENT

CANCEL CLAIMS

Please cancel claims 1-12 and 29-31.

NEW CLAIMS

Please insert new claims 32-60 as follows:

32. **(NEW)** A device for inspecting the interior of a reformer tube used in chemical processing for the presence of abnormalities comprising:

a housing, wherein the housing further includes:

a light source;

means for focusing the light source on an interior surface of said reformer tube;

means for detecting reflected light from the light source focused on the interior of said reformer tube; and

means for moving the housing through said reformer tube.

33. **(NEW)** The device for inspecting the interior of a reformer tube used in chemical processing for the presence of abnormalities according to Claim 32, wherein said focusing means includes a device for projecting a focused ring of light on an interior surface of said reformer tube.

34. **(NEW)** The device for inspecting the interior of a reformer tube used in chemical processing for the presence of abnormalities according to Claim 32, wherein the focusing means further includes a substantially conical mirror for projecting the light beam onto the interior surface of the reformer tube.

35. **(NEW)** The device for inspecting the interior of a reformer tube used in chemical processing for the presence of abnormalities according to Claim 34, wherein the conical mirror has a parabolic shape for projecting and focusing the light beam onto the interior surface of the reformer tube.

36. **(NEW)** The device for inspecting the interior of metal tubes used in chemical processing for the presence of abnormalities according to Claim 35, wherein the detecting means is capable of measuring a position of the reflected light from the interior of the reformer tube surface relative to a field of view of the detecting means.

37. **(NEW)** The device for inspecting the interior of a reformer tube used in chemical processing for the presence of abnormalities according to Claim 36, wherein a field of view of the of the detecting means is positioned such that the field of view of the detecting means minimizes the amount of reflected light collected from the reformer tube surface that was scattered from the housing.

38. **(NEW)** The device for inspecting the interior of metal tubes used in chemical processing for the presence of abnormalities according to Claim 37, wherein the detecting means is one of a position sensitive photo detector (PSD), a lateral effect photo diode detector, a photo diode array detector, a CMOS array detector, a charge-coupled device (CCD) detector and a pixelized array detector.

39. **(NEW)** The device for inspecting the interior of metal tubes used in chemical processing for the presence of abnormalities according to Claim 38, wherein the detecting means is one of a 1-dimensional and 2-dimensional detector.

40. **(NEW)** The device for inspecting the interior of metal tubes used in chemical processing for the presence of abnormalities according to Claim 39, wherein said abnormalities are at least one of manufacturing defect, metal dusting and creep.

41. **(NEW)** The device for inspecting the interior of a reformer tube used in chemical processing for the presence of abnormalities according to Claim 40, wherein the housing is adapted for use in a reformer tube by preventing chemical interaction with the inside surface of said tube.

42. **(NEW)** The device for inspecting the interior of a reformer tube used in chemical processing for the presence of abnormalities according to Claim 41, wherein the housing is constructed so that surfaces which may potentially contact the interior of said tube are constructed out of nonmetallic materials.

43. **(NEW)** The device for inspecting the interior of a reformer tube used in chemical processing for the presence of abnormalities according to Claim 32, wherein said means for focusing the light source on the surface of said tube further includes,

a rotating portion of the housing, wherein the rotating portion of housing includes the light source and the means for detecting the light focused on the interior surface of said reformer tube.

44. **(NEW)** The device for inspecting the interior of a reformer tube used in chemical processing for the presence of abnormalities according to Claim 43, wherein a field of view of the of the detecting means is positioned such that the field of view of the detecting means minimizes the amount of reflected light collected from the reformer tube surface that was scattered from the housing.

45. **(NEW)** The device for inspecting the interior of metal tubes used in chemical processing for the presence of abnormalities according to Claim 44, wherein the detecting means is capable of measuring a position of the reflected light from the interior of the reformer tube surface relative to a field of view of the detecting means.

46. (NEW) The device for inspecting the interior of metal tubes used in chemical processing for the presence of abnormalities according to Claim 45, wherein the detecting means is one of a position sensitive photo detector (PSD), a lateral effect photo diode detector, a photo diode array detector, a CMOS array detector, a charge-coupled device (CCD) detector and a pixelized array detector.

47. (NEW) The device for inspecting the interior of metal tubes used in chemical processing for the presence of abnormalities according to Claim 46, wherein the detecting means is one of a 1-dimensional and 2-dimensional detector.

48. (NEW) The device for inspecting the interior of metal tubes used in chemical processing for the presence of abnormalities according to Claim 47, wherein said abnormalities are at least one of manufacturing defect, metal dusting and creep.

49. (NEW) The device for inspecting the interior of metal tubes used in chemical processing for the presence of abnormalities according to Claim 47, wherein said high speed operation is achieved by using a material that is substantially lighter than metal for the body of said device.

50. (NEW) The device for inspecting the interior of a reformer tube used in chemical processing for the presence of abnormalities according to Claim 49, wherein the housing is adapted for use in a reformer tube by preventing chemical interaction with the inside surface of said tube.

51. (NEW) The device for inspecting the interior of a reformer tube used in chemical processing for the presence of abnormalities according to Claim 50, wherein the housing is constructed so that surfaces which may potentially contact the interior of said tube are constructed out of nonmetallic materials.

52. (NEW) The device for inspecting the interior of a reformer tube used in chemical processing for the presence of abnormalities according to Claim 32, wherein said means for focusing the light source on the surface of said tube further includes,

a rotating portion of the housing, wherein the rotating portion of housing includes the light source.

53. (NEW) The device for inspecting the interior of metal tubes used in chemical processing for the presence of abnormalities according to Claim 32, wherein the detecting means is capable of measuring a position of the reflected light from the interior of the reformer tube surface relative to a field of view of the detecting means.

54. (NEW) The device for inspecting the interior of a reformer tube used in chemical processing for the presence of abnormalities according to Claim 53, wherein the detecting means is capable of measuring a position of the reflected light from the interior of the reformer tube surface relative to a field of view of the detecting means.

55. (NEW) The device for inspecting the interior of metal tubes used in chemical processing for the presence of abnormalities according to Claim 54, wherein the detecting means is one of a position sensitive photo detector (PSD), a lateral effect photo diode detector, a photo diode array detector a CMOS array detector, a charge-coupled device (CCD) detector and a pixelized array detector.

56. (NEW) The device for inspecting the interior of metal tubes used in chemical processing for the presence of abnormalities according to Claim 55, wherein the detecting means is one of a 1-dimensional and 2-dimensional detector.

57. **(NEW)** The device for inspecting the interior of metal tubes used in chemical processing for the presence of abnormalities according to Claim 56, wherein said abnormalities are at least one of manufacturing defect, metal dusting and creep.

58. **(NEW)** The device for inspecting the interior of a reformer tube used in chemical processing for the presence of abnormalities according to Claim 57, wherein the housing is adapted for use in a reformer tube by preventing chemical interaction with the inside surface of said tube.

59. **(NEW)** The device for inspecting the interior of a reformer tube used in chemical processing for the presence of abnormalities according to Claim 58, wherein the housing is constructed so that surfaces which may potentially contact the interior of said tube are constructed out of nonmetallic materials.

60. **(NEW)** The device for inspecting the interior of metal tubes used in chemical processing for the presence of abnormalities according to Claim 58, wherein said high speed operation is achieved by using a material that is substantially lighter than metal for the body of said device.

REMARKS

Applicants respectfully submit that no new mater has been introduced in the application by the addition of new claims 32-60. Applicants further submit that no additional fees are required at this time.

Conclusions

In view of the foregoing, Applicants respectfully request consideration and reexamination of this application and the timely allowance of the pending claims.

Respectfully submitted,

Hayward A. Verdun, LLP

By: _____

Hayward A. Verdun

Reg. No. 43,223

Dated: June 10, 2004

Hayward A. Verdun, LLP
609 Alder Ave NE, Suite 1000
Bainbridge Island, WA 98110
206.855.8697
206.396.8683